

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB73

251-94

Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule for Endangered Status and Critical Habitat for the Alabama Sturgeon**AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Proposed rule; withdrawal.

SUMMARY: The U.S. Fish and Wildlife Service (Service) withdraws the proposed rule to determine endangered status and critical habitat for the Alabama sturgeon (*Scaphirhynchus suttkusi*) under the Endangered Species Act of 1973, as amended (Act). This sturgeon is endemic to, and was once widespread in, the Mobile River system in Alabama and Mississippi. It has significantly declined in both population size and range during the past century. The fish was last known to exist in only a short, free-flowing reach of the Alabama River downstream of Claiborne Lock and Dam in Clarke and Monroe Counties, Alabama; it may still exist in some other portions of its historical range. The primary factors that have likely contributed to the sturgeon's decline include dams, the development of the rivers for navigation, altered river flows, gravel-mining operations, general habitat degradation from land use practices, and, perhaps, overfishing (particularly at the turn of the century). The Service finds there to be insufficient information to justify listing a species that may no longer exist.

ADDRESSES: For the first 6 months following the publication of this notice, the complete administrative file for the action will be available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Asheville Field Office, 330 Ridgefield Court, Asheville, North Carolina 28806. Six months after publication, the administrative file will be transferred to the U.S. Fish and Wildlife Service, Jackson Field Office, 6578 Dogwood View Parkway, Suite A, Jackson, Mississippi 39213.

FOR FURTHER INFORMATION CONTACT: For information or comment upon this action for the first 6 months following publication, contact Mr. Richard G. Biggins at the above Asheville address (704/665-1195, Ext. 228) or Mr. Robert S. Butler, U.S. Fish and Wildlife Service, 6620 Southpoint Drive South,

Suite 310, Jacksonville, Florida 32216 (904/232-2580).

SUPPLEMENTARY INFORMATION:**Background**

The Mobile River system is the largest drainage east of the Mississippi River that empties into the Gulf of Mexico. The system drains ten physiographic provinces, providing a unique mosaic of aquatic habitats and environments (U.S. Fish and Wildlife Service 1994). Several Southeastern regional aquatic faunas have influenced the Mobile River system's aquatic fauna. The influence of these regional faunas, coupled with the size of the system and the diversity of its aquatic habitats and physiographic features, has resulted in a high degree of diversity and endemism. The high percentage of aquatic endemism is particularly manifested in the snail (93 percent endemic), mussel (40 percent), and freshwater fish (25 percent) faunas, as well as in the crayfish and aquatic insect faunas (U.S. Fish and Wildlife Service 1994).

Commensurate with the high level of diversity and endemism, the Mobile River system also has a high number of federally protected and candidate aquatic species. Presently, 17 mussels, 8 fishes, 2 turtles, and 1 snail are protected under the Act, and 64 more aquatic taxa are candidates for Federal protection (U.S. Fish and Wildlife Service 1994). The Service has also documented the extinction of 37 endemic snail and 18 endemic mussel taxa in the Mobile River system (U.S. Fish and Wildlife Service 1994). The high extinction rate and the number of federally protected and candidate taxa in the system clearly define an unstable and imperiled riverine ecosystem. Further decline of the riverine ecosystem can be expected if the anthropogenic forces impacting the fauna continue without considering the needs of this aquatic ecosystem.

The Alabama sturgeon, once called the Alabama shovelnose sturgeon, or simply shovelnose sturgeon, has been recognized since 1976 as a distinct, undescribed taxon (Ramsey 1976) that is most similar to the shovelnose sturgeon (*Scaphirhynchus platyrhynchus*) of the Mississippi River system. The Alabama sturgeon is a relatively small sturgeon; the maximum standard length is about 72 centimeters (28 inches). It has an elongated, heavily armored, depressed body and an attenuated caudal peduncle. The caudal fin has a long filament on the upper lobe that is characteristic of the genus. Sexual dimorphism is slight. Morphological characteristics of the juvenile Alabama

sturgeon are unknown. The Alabama sturgeon can generally be distinguished from the shovelnose sturgeon by several characters; the Alabama sturgeon almost always has larger eyes, it has different plate numbers posterior to the anal fin, there is a difference in dorsal fin ray numbers (Williams and Clemmer 1991; Mayden and Kuhajda, in press), and there are diagnostic characters associated with its head armature (Mayden and Kuhajda, in press).

The Alabama sturgeon was described as *S. suttkusi* by Williams and Clemmer (1991) and was accepted as a distinct species in the proposed rule of June 3, 1993 (58 FR 33148). Subsequently, various scientists have examined museum specimens of the Alabama sturgeon and genetically analyzed tissue samples from a specimen captured in December 1993. A comparison of these specimens was then made with the congeneric shovelnose and pallid sturgeons, both of the Mississippi River system. (The latter species was listed as endangered on September 6, 1990 (55 FR 36647).) Various investigators have derived conflicting results as to the Alabama sturgeon's taxonomic distinctiveness.

In the original description of the Alabama sturgeon (Williams and Clemmer 1991), a comparison based on morphological characters was made of the Alabama sturgeon to several populations, mostly southern or lower midwestern, of the shovelnose sturgeon. Mayden and Kuhajda (in press), in a study recently accepted for publication in a peer-reviewed scientific journal, concluded that the Alabama sturgeon is indeed a distinct species. In fact, they found three additional diagnostic morphological characters associated with head armature that would distinguish the Alabama sturgeon from the shovelnose sturgeon, which are based upon a thorough reexamination of the raw data used in the original description, combined with data gathered from the recently captured Alabama sturgeon and data from additional shovelnose sturgeon populations. In addition, there was no evidence of geographic clinal variation in these diagnostic features to suggest that the two taxonomic entities were not morphologically distinct at the species level (Mayden and Kuhajda, in press).

Unpublished reports by Howell (1993, 1994), Blanchard and Bartolucci (1994), and Blanchard (1994) also reevaluated the raw data used in the description by Williams and Clemmer (1991). These studies questioned the taxonomic validity of *S. suttkusi*. They concluded that the data analyses in the original description were inconclusive and that

the Alabama sturgeon could not be distinguished from the shovelnose sturgeon. In another unpublished report, Howell *et al.* (1994) critiqued Mayden and Kuhajda (in press), questioning their statistical methods and repudiating one of the three additional taxonomic characters determined to separate the two sturgeon species in the latter study. However, the Mayden and Kuhajda study (in press) has been peer-reviewed and accepted for publication in a scientific journal.

The capture of a single specimen of the Alabama sturgeon in December 1993 afforded scientists the opportunity to obtain fresh tissue samples and compare its genetic distinctiveness with other sturgeons. One completed, but unpublished, report comparing the genetics of these two sturgeons (Schill and Walker 1994) concluded that the Alabama shovelnose and pallid sturgeons were indistinguishable based on estimates of sequence divergence at the mitochondrial cytochrome *b* locus. This result is similar to other studies where no cytochrome *b* differentiation was found among other fish species within a genus where the species were based on well-accepted morphological, behavioral, and other characteristics (Awise 1994). Therefore, the use of the very conservative cytochrome *b* locus appears to be of little taxonomic use in differentiating members of the genus *Scaphirhynchus*.

The Service has received a very recent study report prepared for the Corps of Engineers and the Service (Genetic Analyses 1994). The study compared a number of nuclear DNA markers for the three *Scaphirhynchus* sturgeons and found no measurable difference between pallid and shovelnose sturgeons but significant differences between those sturgeons and the one Alabama sturgeon. Further, this study shows that the single specimen of Alabama sturgeon captured in 1993 was considerably different from pallid and shovelnose sturgeons. This genetic study also indicated that another specimen of Alabama sturgeon would very probably provide conclusive evidence of these consistent differences.

The Service recognizes that the taxonomic status of the Alabama sturgeon is being reviewed by the scientific community. However, none of the recent taxonomic information has been subjected to peer review and published in a scientific journal, with the exception of the study of Mayden and Kuhajda (in press), which has been accepted for publication in a peer-reviewed scientific journal. Williams and Clemmer's (1991) description of the Alabama sturgeon was published in a

peer-reviewed scientific journal and complied with all the rules of the *International Code of Zoological Nomenclature* (§ 17.11(b)). Furthermore, the study by Mayden and Kuhajda (in press) corroborates the determination by Williams and Clemmer (1991) that the Alabama sturgeon is a distinct species.

Thus, until such time as the Alabama sturgeon's taxonomic status is revised in an appropriate peer-reviewed scientific journal and accepted by the scientific community, the Service will consider the Alabama sturgeon (*S. suttkusi*) to be a distinct species based on these two studies. The Alabama sturgeon's taxonomy may be subsequently revised to subspecies or population status by the scientific community; if so, the Alabama sturgeon would still qualify as being eligible for protection under the Act (see the response to Issues 22 and 45 in the "Summary of Comments and Recommendations" section of this notice).

Section 3(15) of the Act (16 U.S.C. 1531-1544), specifically provides for listing species, subspecies, and distinct population segments of vertebrate species as endangered or threatened. Although the Service finds that there is some disagreement among ichthyologists concerning the Alabama sturgeon's taxonomic status, the Service has determined that the Alabama sturgeon warrants recognition as a species as defined by the Act.

The Alabama sturgeon is known only from the Mobile River system of Alabama and Mississippi. Historically, this sturgeon was found in the Mobile, Tensas, Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa, and Coosa Rivers of the Mobile River system (Burke and Ramsey 1985). The only recent confirmed record of the Alabama sturgeon (since about 1985) is from the free-flowing portion of the Alabama River downstream of Claiborne Lock and Dam, Clarke and Monroe Counties, Alabama.

The Alabama sturgeon was once common in Alabama. In a statistical report to Congress in 1898 (U.S. Commission of Fish and Fisheries 1898), the total catch of "shovelnose sturgeon" from Alabama was 19,500 kilograms (kg) (42,900 pounds (lb)). Of this total, 18,000 kg (39,500 lb) came from the Alabama River, 1,000 kg (2,300 lb) from the Black Warrior River, and 500 kg (1,100 lb) from the Tennessee River. The "shovelnose sturgeon" reported from the Alabama and Black Warrior Rivers was the Alabama sturgeon (*S. suttkusi*), which averages about 1 kilogram (2 lb) for a large specimen; the sturgeon from the Tennessee River was the shovelnose

sturgeon (*S. platyrhynchus*). An anonymous article in the *Alabama Game and Fish News* in 1930 stated that the Alabama sturgeon was "not uncommon."

Records of this fish supported by preserved specimens are rare. Clemmer (1983) listed 23 specimens in museum collections. In their status survey, Burke and Ramsey (1985) captured only five Alabama sturgeons. Williams and Clemmer (1991) located another nine specimens in addition to those examined by Clemmer (1983), making a total of 32 specimens in museum, university, and private collections. Interestingly, since 1953 there has generally been a 7- to 8-year hiatus between representative collections of the Alabama sturgeon in museums (Mayden and Kuhajda, in press), suggesting that the population may cycle in abundance. It would appear that the Alabama sturgeon, throughout much of its life, occupies habitat that is inaccessible to collectors (Kuhajda, University of Alabama, *in litt.*, 1994). Based on museum records, the Alabama sturgeon has been captured in February, March, April, May, June, November, and December, with the majority of specimens representing spring collections (Kuhajda, *in litt.*, 1994). Verified localities of the captures have primarily been large channels of big rivers in the Mobile River system. However, a couple of Alabama sturgeon records are from oxbow lakes (Williams and Clemmer 1991).

When the proposed rule was published (June 15, 1993; 58 FR 33148), the most recent documented evidence of the Alabama sturgeon's continued existence consisted of the capture of five Alabama sturgeons in 1985 (Burke and Ramsey 1985); two were gravid females and one was a juvenile about 2 years old. Biologists from the Alabama Department of Conservation and Natural Resources (ADCNR), with the assistance and cooperation of the U.S. Army Corps of Engineers (Corps), have in recent years (1990 and 1992) conducted periodic searches for the Alabama sturgeon, utilizing a variety of sampling gear, without verifying the presence of a single specimen (Tucker and Johnson 1991, 1992). Nevertheless, the gravid females and juvenile Alabama sturgeons captured by Burke and Ramsey (1985) provided sufficient evidence that reproduction was occurring during at least the mid-1980s. Coupled with a high longevity, the likelihood that the Alabama sturgeon could have survived to the present appeared sufficient to warrant making the proposal.

Since the Burke and Ramsey (1985) status survey, there have been several

anecdotal reports by commercial fishermen that two distinct sturgeons have been taken from the Mobile River system in portions of the Alabama River upstream of Claiborne Lock and Dam. These reports presumably refer to the Alabama sturgeon and the Gulf sturgeon (*Acipenser oxyrinchus desotoi*). The Gulf sturgeon can achieve lengths up to 2 meters (m) (6.6 feet), lacks the long filament on the upper lobe of the caudal fin, is generally more robust, and has a shorter and deeper caudal peduncle than does the Alabama sturgeon. In addition, the Gulf sturgeon is anadromous, migrating as adults up rivers from the Gulf of Mexico to spawn. The Gulf sturgeon was listed as threatened on September 30, 1991 (56 FR 49658).

The Service and the ADCNR conducted an extensive sampling program in 1993 in an effort to locate the Alabama sturgeon in the Mobile River system. On December 2, 1993, a mature male Alabama sturgeon was caught alive in a gill net by staff of the Service's Panama City, Florida, Field Office. The capture site was in the free-flowing portion of the Alabama River downstream of Claiborne Lock and Dam, Clarke and Monroe Counties, Alabama. This specimen represents the only verified record of the Alabama sturgeon in about 8 years. From the chronology of commercial harvest and scientific collections of the Alabama sturgeon, it is obvious that this fish has experienced a tremendous decline in both population size and range in just 100 years.

After publication of the notice of a 6-month extension of the deadline and comment period (June 21, 1994; 59 FR 3197), the Service undertook further efforts to capture specimens of the Alabama sturgeon. These efforts, which began in late September 1994, are planned to continue semi-monthly until May 1995, environmental conditions permitting. The Service is primarily using gill nets, with lesser emphasis on utilizing trotlines and electrofishing, in efforts to capture this fish. Sampling effort is focused on the free-flowing portion of the Alabama River downstream of Claiborne Lock and Dam. At the time of publication of this notice of withdrawal, the Service had not collected any specimens of the Alabama sturgeon in 1994.

The specific habitat needs of the Alabama sturgeon are largely unknown. The shovelnose sturgeon is most common in river channels that have strong currents over sand, gravel, and rock substrates (Trautman 1981, Hurley *et al.* 1987, Curtis 1990) but may occasionally occur over softer sediments

(Bailey and Cross 1954). Habitat selection also appears to be dictated by current velocities (Hurley *et al.* 1987). The shovelnose sturgeon often uses habitats associated with channel-training devices (Hurley and Nickum 1984, Hurley *et al.* 1987, Curtis 1990), which are water-diversion structures (e.g., training dikes, wing walls, and closing dams) used for directing currents to maintain channels. The association of the shovelnose sturgeon with these habitats may be correlated with higher prey item densities and suitable current velocities (Hurley *et al.* 1987); high silt loads directly impact many invertebrates that require a relatively stable substrate. The Corps provided funds for the Service to investigate the possibility that the Alabama sturgeon also uses habitats associated with channel-training devices in the Alabama River. However no conclusions were derived from this study as no Alabama sturgeons were captured (Corps, *in litt.*, 1993).

Based upon the limited information available, the Alabama sturgeon appears to prefer relatively stable substrates of gravel and sand in river channels with swift currents (Burke and Ramsey 1985). Relying upon data from Alabama sturgeon prey items and the prey's typical habitats, it was hypothesized (Haynes 1994) that the Alabama sturgeon, primarily collected from the confluence of the Cahaba and Alabama Rivers, was using feeding habitat that could include areas that are relatively shallow and sandy and that have a slow to moderate current. Limited data collected from a radio-collared Alabama sturgeon suggested that it frequented swift currents in water 7.5 to 12.0 m (25 to 40 feet) deep (Burke and Ramsey 1985).

Members of the genus *Scaphirhynchus* are freshwater fish (Bailey and Cross 1954) that do not make seasonal migrations to and from the sea. Sturgeons are thought to swim upstream to spawn (Becker 1983). Shovelnose sturgeons, based on telemetry studies conducted during the spawning season, were found to migrate limited distances (Hurley *et al.* 1987). Spawning habitats for the Alabama sturgeon are generally unknown. Spawning shovelnose sturgeons generally use hard substrates that may occur in main-channel areas or deep-water habitats associated with channel-training devices in major rivers or possibly in tributaries (Hurley and Nickum 1984). Observations by Burke and Ramsey (1985) suggest that the Alabama sturgeon prefers spawning habitat similar to the shovelnose sturgeon.

Currents are required for the development of sturgeon's adhesive eggs, which require 5 to 8 days to hatch (Burke and Ramsey 1985). Shovelnose sturgeon spawning apparently occurs from April to July (Moos 1978). The spawning period for the shovelnose sturgeon probably depends upon water temperature and flows (Moos 1978), as it does for numerous other fish species. Henry and Ruelle (1992) conducted a study of shovelnose sturgeon reproduction in the Mississippi River system, concluding that they do not spawn every year and that poor body condition may result in the production of fewer eggs or infrequent spawning attempts. The shovelnose sturgeon was reported to reach sexual maturity after 4 to 6 years, with spawning occurring at 1- to 3-year intervals (Helms 1974, Moos 1978). Little is known about the Alabama sturgeon's reproductive biology. However, given what is known concerning the chronology of Alabama sturgeon collections and the reproductive biology of other sturgeon species, populations of the Alabama sturgeon may be cyclical, with peak numbers possibly occurring every 7 to 8 years (Mayden and Kuhajda, *in press*).

Several studies have aged sturgeon of the genus *Scaphirhynchus* by cross-sectioning pectoral fin spines. Helms (1973) aged shovelnose sturgeons in the Mississippi River at up to 12 years. Durkee *et al.* (1979) aged shovelnose sturgeons at up to 14 years in the upper Mississippi River system. Ages ranged from 8 to 27 years for the 288 shovelnose sturgeons sampled from the Missouri River (Zweiacker 1967). However, Zweiacker (1967) could not validate the marks interpreted as annuli (Moos 1978). Ruelle and Keenlyne (1993) aged three pallid sturgeons (*S. albus*) in the Missouri River at 10, 37, and 41 years. Considering the longevity of other members of this genus, the rarity of the Alabama sturgeon, the extreme difficulty in capturing specimens, and the several-year hiatus that occurs between major year classes, frequent Alabama sturgeon encounters should not be expected.

Burke and Ramsey (1985) conducted stomach analyses of a few Alabama sturgeons. They found that aquatic insect larvae were a major dietary component, but fish eggs, snails, mussels, and fish were also taken. A recent study (Haynes 1994) examined the stomach contents of 12 additional Alabama sturgeon specimens. Aquatic insects, which were found in all 12 stomachs, were represented primarily by true flies (mostly Ceratopogonidae and Chironomidae), mayflies (mostly Heptageniidae), dragonflies (mostly

Gomphidae), and caddisflies (mostly Hydropsychidae). Small fish and plant material were also found in five and four stomachs, respectively (Haynes 1994). The shovelnose sturgeon, based on a study conducted in the Missouri River, is an opportunistic feeder (Modde and Schmulbach 1977); various groups of aquatic insect larvae generally comprised their diet in that river (Modde and Schmulbach 1977, Durkee *et al.* 1979).

Previous Federal Actions

The Alabama sturgeon was included in **Federal Register** notices of review for candidate animals in 1982, 1985, 1989, and 1991. In the 1982 notice (47 FR 58454) and in the 1985 notice (50 FR 37958), this fish was listed as a category 2 species (sufficient information indicates proposing to list may be appropriate, but conclusive data are not currently available to support a proposed rule). In the 1989 and 1991 notices (54 FR 554 and 56 FR 58816), the Alabama sturgeon was listed as category 1 species (substantial information supports listing). On June 15, 1993, the Service proposed the Alabama sturgeon to be listed as endangered with critical habitat (58 FR 33148). The Service has determined that endangered status for the Alabama sturgeon is not appropriate at this time because of insufficient information available to conclude that the species still exists (see the responses to Issues 21, 22, and 45 in the "Summary of Comments and Recommendations" section and the concluding paragraph in the "Summary of Factors Affecting the Species" section of this notice).

Summary of Notices and Related Actions following Proposal

In the June 15, 1993, proposed rule and through associated notifications, interested parties were requested to submit factual reports and information that might contribute to the development of a final rule to list the Alabama sturgeon as endangered with critical habitat. The initial comment period was open until October 13, 1993. Appropriate Federal and State agencies, county governments, scientific organizations, and interested parties were contacted by letter dated June 21, 1993; a copy of the proposed rule was enclosed, and their comments on the rule were solicited. Legal notices were published in the *Birmingham News*, Birmingham, Alabama, on July 25, 1993; the *Mobile Press-Register*, Mobile, Alabama, on July 25, 1993; the *Montgomery Advertiser*, Montgomery, Alabama, on July 24, 1993; and the *Clarion Ledger*, Hinds County,

Mississippi, on July 23, 1993. The proposed rule also stated that a public hearing would be conducted to answer questions and gather additional information on the biology of the Alabama sturgeon and discuss issues relating to the proposed listing and critical habitat designation.

The first scheduled public hearing on the Service's proposal to list the Alabama sturgeon as an endangered species with critical habitat was for August 31, 1993, in Mobile, Alabama. The comment period remained open until October 13, 1993. A notice of the hearing was published in the **Federal Register** on July 27, 1993 (58 FR 40109), and a legal notice was published in the *Birmingham News* on August 1, 1993. This public hearing was subsequently canceled at the request of some members of the Alabama Congressional delegation. A cancellation notice was published in the **Federal Register** on August 24, 1993 (58 FR 44643), and legal notices were published in the *Birmingham News* on August 29, 1993; the *Montgomery Advertiser* on August 29, 1993; and the *Clarion Ledger* on August 27, 1993.

The August 1993 public hearing on this proposal was rescheduled for October 4, 1993, at the William K. Weaver Hall Auditorium on the campus of Mobile College, Mobile, Alabama. The comment period would remain open until October 13, 1993. A notice of the hearing and extension of the comment period was published in the **Federal Register** on September 13, 1993 (58 FR 47851).

Due to the tremendous interest in this issue, a large number of people who came to the October 4, 1993, hearing had to be turned away due to space constraints. Although neither the Act nor the Administrative Procedure Act (5 U.S.C. 551 *et seq.*) required that a second hearing be held, the Service decided that it was in the best interest of all concerned parties that they have an opportunity to comment on issues raised in the Alabama sturgeon proposed rule. Therefore, an additional public hearing was scheduled in Montgomery, Alabama, on November 15, 1993, to allow for additional comments from the interested public. A notice of the second hearing, reopening of the comment period (from October 25, 1993, to December 8, 1993), and notice of availability of a scientific panel report was published in the **Federal Register** on October 25, 1993 (58 FR 55036). Legal notices for this second hearing appeared in the *Birmingham News* on October 26, 1993; the *Mobile Press-Register* on October 24, 1993; the *Montgomery Advertiser* on

October 29, 1993; and the *Clarion Ledger* on October 29, 1993.

In an effort to clarify some of the biological information concerning the sturgeon, the Secretary of the Interior committed the Service to forming a peer-review panel. The Service completed the formation of a panel of biologists in September 1993; the panel was to provide a peer review of all the scientific and commercial data then available and to prepare individual reports to specifically review three issues—(1) the taxonomy of the sturgeon, (2) the likely existence of the fish based on available data, and (3) what information would be necessary to conclude that the taxon is likely extinct just prior to submission of their reports, the panel requested permission to submit a single consolidated report; the Service agreed to this. The report was delivered to the Service on November 5, 1993.

The November 15, 1993, hearing was canceled in response to a preliminary injunction issued on November 9, 1993. The timing of the injunction gave the Service insufficient time to publish public hearing notices of cancellation in either the **Federal Register** or area newspapers. A second public hearing notice appeared in the **Federal Register** (59 FR 289) dated January 4, 1994. The hearing was scheduled for January 13, 1994, and the comment period was extended through January 31, 1994. Legal notices for this rescheduled hearing were published in the *Birmingham News* on December 26, 1993; the *Mobile Press-Register* on December 26, 1993; the *Montgomery Advertiser* on December 27, 1993; and the *Clarion Ledger* on December 28, 1993.

As outlined in the January 4, 1994, **Federal Register** notice, the preliminary injunction restrained the Service and others from (1) disseminating the scientific panel report to the public and (2) utilizing or relying upon the scientific panel report or any product of the experts' deliberations in connection with the decision-making process on the proposal to list the Alabama sturgeon and designate its critical habitat. The January 4, 1994, notice also referred to another court order issued December 22, 1993; the relevant parts of that court order are as follows:

Federal defendants and defendant-intervenor, and those acting in active concert with them, are hereby permanently enjoined from publishing, employing and relying upon the advisory Committee report . . . for any purpose whatsoever, directly or indirectly, in the process of determining whether to list the Alabama sturgeon as an endangered species.

In a notice appearing in the *Federal Register* (59 FR 997) on January 7, 1994, the January 13, 1994, public hearing was canceled and rescheduled for January 31, 1994, at South Hall #1, Montgomery Civic Center, Montgomery, Alabama. The comment period was extended to February 15, 1994. Cancellation of the second public hearing was made to provide more notice of the hearing to the public. Legal notices for the rescheduled public hearing appeared on January 19, 1994, in four area newspapers—the *Birmingham News*, *Mobile Press-Register*, *Montgomery Advertiser*, and *Clarion Ledger*. Mention was also made in this notice that, in keeping with the court restrictions issued in *Alabama-Tombigbee River Development Coalition (Coalition) v. Fish and Wildlife Service*, Civ. No. 93-AR-2322-S, the Service considered itself compelled to enforce constraints on the submission of oral and written comments while the court restrictions remained in effect. Individuals or organizations could not refer to the scientific report or to any drafts or other products derived from the preparation of that report in presenting any oral statement or written comment and individuals or organizations could not attempt to bolster their oral or written comments or opinions by referring to the scientific report as authority. Therefore, the departmental hearing officer at the next hearing was authorized to terminate the opportunity to speak of any person making a statement if, in the judgment of the hearing officer, that person disregarded the instructions not to address the scientific report or its contents. Written comments or materials which contained information that violated the above restrictions would be marked and thereafter excluded from the administrative record while the court restrictions remained in effect.

The *Federal Register* (59 FR 31970) on June 21, 1994, contained a notice of a 6-month extension of the deadline and reopening of the comment period for the proposed rule to list the Alabama sturgeon as an endangered species with critical habitat. The Service's rationale for the 6-month extension was based on the premise that there continued to be a lack of substantial information available concerning whether the Alabama sturgeon still existed. The comment period was reopened through September 15, 1994, to seek additional comments on the population status of the Alabama sturgeon, and the deadline for final action on the proposal was extended to December 15, 1994. Legal notices for the extension and reopening

of the comment period appeared in the *Birmingham News* on August 11, 1994; the *Mobile Press-Register* on August 5, 1994; the *Montgomery Advertiser* on August 8, 1994; and the *Clarion Ledger* on August 12, 1994.

On September 15, 1994, the *Federal Register* (59 FR 47294) contained a notice that further extended the comment period to October 17, 1994, and sought additional comments on only the scientific point of whether the Alabama sturgeon still exists. Legal notices for this extension of the comment period appeared in the *Birmingham News* on September 28, 1994; the *Mobile Press-Register* on September 24, 1994; the *Montgomery Advertiser* on September 23, 1994; and the *Clarion Ledger* on September 28, 1994. By way of 81 letters to scientists dated September 13, 1994, the Service requested comments on two specific questions regarding the sturgeon's continued existence—(1) Is it likely that the Alabama sturgeon (*Scaphirhynchus suttkusi*) still exists in the Mobile River system and (2) what information would be needed to substantiate claims that the Alabama sturgeon is likely extinct?

Eight scientists responded to this inquiry. Five respondents strongly supported the assertions that the Alabama sturgeon is extant, and that at least several decades of negative data from sturgeon sampling efforts would be needed to consider the species extinct. The other three respondents did not specifically address the question of the present existence of the sturgeon.

The Service believes that it is premature to make a definitive decision on the species' continued existence (see the response to Issue 15). Therefore, the Service finds that there is insufficient information available that the Alabama sturgeon is still extant.

Summary of Public Comments

The Service received several thousand written and oral comments associated with the two hearings, the two extended comment periods regarding the proposed listing of the Alabama sturgeon with critical habitat, and the two comment periods associated with the 6-month extension of the deadline. Several hundred individuals and organizations supported the listing; however, the vast majority of the respondents did not support the listing and most of these comments were opinions based upon perceived economic impacts and not scientific data, as required under the Act. Following is a summary of the comments, concerns, and questions (referred to as "Issues" for the purpose of this summary) expressed in writing or

presented orally during the comment periods and at the public hearings. Issues of similar content have been addressed under one issue heading. These issues and the Service's response to each are presented below.

Issue 1: Various respondents were concerned that listing the Alabama sturgeon would require the Corps' maintenance dredging of the Alabama River to be sharply curtailed or even eliminated, ultimately ceasing barge navigation on the river and costing millions, or billions, of dollars in lost revenue and possibly 20,000 jobs to the Alabama economy.

Response: Maintenance dredging by the Corps to maintain the navigation channel on the Alabama and lower Tombigbee Rivers annually removes 1.5 to 3.8 million cubic meters (2 to 5 million cubic yards) of unconsolidated aggregate (e.g., sand, mud, and silt). Dredge material from the Tombigbee River downstream of Coffeetown, Alabama, is disposed of at upland sites and within the banks of the river. On the Alabama River, fewer upland disposal areas have been established, and the majority of the dredge material is placed within the shallow reaches of the river.

Based on limited information on the Alabama sturgeon and studies of the shovelnose sturgeon, it appears that these fish require currents over relatively stable substrates for feeding and spawning (see "Background" section of this notice). They are generally not associated with those unconsolidated substrates that settle in slower current areas and must be removed annually to maintain navigation. Therefore, removal and disposal of unconsolidated materials is not perceived as a threat to the sturgeon or to its feeding or spawning habitat.

In the proposed rule, the Service expressed concern that turbidity increases associated with the Corps' annual maintenance dredging could affect the sturgeon, and the Service still has some concern regarding this issue. The Corps and the Service agree that (1) the Alabama and Tombigbee Rivers are currently characterized as turbid rivers; (2) channel maintenance activities produce only localized and temporary elevation of turbidity; (3) the extent to which turbidity impacts the Alabama sturgeon is unknown; and (4) the Corps, in cooperation with the Service, will pursue research (within 3 years and based on the availability of funds) regarding the potential impacts of maintenance dredging activities, including turbidity, on the shovelnose sturgeon. Consequently, the Service has concurred with the Corps'

determination that, based on current information, their annual maintenance dredging program does not adversely affect the Alabama sturgeon.

Thus, as it is currently believed that the Corps' annual maintenance dredging program on the Alabama and lower Tombigbee Rivers is not likely to affect the Alabama sturgeon, these channel maintenance activities will not need to be eliminated, modified in timing or duration, or altered to protect any surviving Alabama sturgeon. Therefore, no loss of revenue from diminished annual channel maintenance activities would have been associated with the listing of the Alabama sturgeon (see response to Issue 19).

Issue 2: Numerous respondents felt that the Service had failed to meet the minimum standard of proof that the Alabama sturgeon was an endangered species. Therefore, the Service cannot comply with the Act's best available information standard for making a listing determination.

Response: The Service agrees that little information exists on the species' life history, environmental requirements, or its historic and current population levels. However, the best available information standard (section 4(b)(1)(A)—"A determination to list a species shall be based on the best available scientific and commercial information on the species' status") does not require the Service to possess detailed or extensive information upon the general biology of the species or an actual determination of the causes for this status in order to make a listing determination. The Act's information standard requires only that the best available information must support a conclusion that the species meets the Act's definition for threatened or endangered species status after consideration of the five factors discussed in the "Summary of Factors Affecting the Species" section of this notice.

On July 1, 1994, the Service announced (59 FR 34271) an interagency policy to provide criteria, establish procedures, and provide guidance to ensure that decisions made by the Service represent the best available scientific and commercial data available. The Service has complied with those procedures and criteria of the policy in making this decision and has carefully reviewed all data submitted on this matter.

For example, the best available information clearly supports the conclusion that the species has experienced a significant population decline in the last 100 years. The Alabama sturgeon was common in the

late 1890s (U.S. Commission of Fish and Fisheries 1898) and was reported to be "not uncommon" in the 1930s (Anonymous 1930). However, Burke and Ramsey (1985) were able to capture only five Alabama sturgeons in the mid-1980s. After searches by the ADCNR in 1990, 1991, and 1992, utilizing a variety of sampling gear (Tucker and Johnson 1991, 1992), and by the ADCNR and the Service in 1993, only one specimen was captured. Based on these factors and other information discussed in the "Summary of Factors Affecting the Species" section of this notice, the Service is confident that the best available information standard, as required by the Act, was met in the decision to withdraw the proposal to list the Alabama sturgeon as endangered.

Issue 3: Several respondents believed that the Service should defer any decision to list the species until solid, verifiable scientific information is available on the fish's habitat requirements, threats, and population status.

Response: As discussed in the response to Issue 2, the Act does not require the Service to possess detailed or extensive information on the first two factors in order to make a listing determination. However, the Service has concluded that there is insufficient information available to substantiate the present existence of this species.

Issue 4: A few respondents stated that the Alabama sturgeon did not need Federal protection because Alabama State law provided sufficient protection for the species.

Response: Alabama State law does prohibit take and possession of the Alabama sturgeon without a State scientific collecting permit. However, this law does not protect the species from other threats. Federal listing would provide significant additional protection for the species by requiring Federal agencies to consult with the Service when projects they fund, authorize, or carry out may adversely affect the Alabama sturgeon. In addition, listing would make section 6 funding under the Act available to the State of Alabama for Alabama sturgeon recovery activities.

Issue 5: One respondent contended that listing the sturgeon would have a significant effect on the cost and duration of the U.S. Department of Agriculture's (USDA) boll weevil eradication program.

Response: In a March 23, 1994, letter, the Service informed the USDA of specific pesticide use restrictions that USDA must meet in order to avoid adverse effects to listed aquatic species by their boll weevil eradication program. As the Alabama sturgeon

inhabited the same riverine systems as other federally listed aquatic species covered by the March letter, the Service does not believe that listing the Alabama sturgeon would have a separate or significant impact on the cost or duration of the boll weevil eradication program.

Issue 6: Several respondents stated that listing the sturgeon would require changes in the State's water quality standards.

Response: Although it is possible that some point-source discharges negatively impact the Alabama sturgeon, there is no evidence to support the conclusion that the State's water quality standards must be changed if the fish were ever to be listed. As discussed in the proposed rule, the potential exists for point discharges to impact the Alabama sturgeon, and it is noted that there is an increasing demand for discharge permits in the Mobile River system. However, there are two factors that work to minimize any impacts to this fish from point-source discharges—(1) as the Alabama sturgeon inhabits larger channel areas, the effects of any point discharge into its habitat would likely be minimized by dilution and (2) the State of Alabama, with assistance from and oversight by the Environmental Protection Agency (EPA), sets water quality standards that are presumably protective of aquatic life.

It is the Service's position, as stated in the proposed rule, that as long as current fish and wildlife standards under the Clean Water Act of 1977 (CWA) are used to issue discharge permits and the conditions of the permits are enforced, there is no need to modify the State's water quality standards to protect the Alabama sturgeon. A violation of State water quality standards would be a violation of the CWA, and listing the Alabama sturgeon could potentially increase noncompliance penalties. However, based on current information, the need for changes in State water quality standards would not have increased if the species had been listed.

Issue 7: A respondent stated that if the Alabama sturgeon was listed the resulting recovery plan would restrict land use practices.

Response: Recovery plans do not impose restrictions on private land use practices. However, as there is a strong, direct correlation between poor land use practices and unhealthy aquatic ecosystems, the Service encourages landowners to consider any impacts their activities might have on aquatic resources. A recovery plan for the sturgeon would likely address this issue and suggest best management practices

for various land uses. Recovery plan development would proceed under the policy announced by the Service on July 1, 1994 (59 FR 34272); this policy provides, among other points, for participation by all stakeholders in the development of a plan and the minimization of the social and economic impacts of its implementation.

Issue 8: Several respondents stated that listing the sturgeon would adversely impact the gravel-mining industry.

Response: In-stream gravel mining involves work in navigable waters of the United States and includes the discharge of the noncommercial dredge material back into the waterway. Thus, in-stream gravel mining comes under the Corps' authority, pursuant to section 10 of the River and Harbors Act of 1899 (RHA) (33 U.S.C. 403) and section 404 of the CWA (33 U.S.C. 1344). The Service believes that the Alabama sturgeon likely uses relatively stable substrate for breeding and feeding habitat (see "Background" section of this notice for a more detailed discussion of this fish's life history and biology). Thus, mining of this stable substrate could threaten the species. However, the Service believes the mining of unconsolidated material or relatively stable material that is covered by several inches of fine sediment would not be likely to jeopardize the species' continued existence.

Prior to the issuance of a permit by the Corps for in-stream gravel mining, the applicant must receive State water quality certification from the State of Alabama pursuant to section 401 of the CWA. As the Service does not believe that more restrictive water quality standards would have been needed to protect the Alabama sturgeon from this activity, the likelihood of an applicant's receiving State water quality certification will not be affected by the listing of the Alabama sturgeon. However, as in-stream gravel mining generally produces higher turbidity levels than are produced by maintenance dredging, the Service believes that increases in turbidity within Alabama sturgeon habitat from in-stream gravel mining activities could be considered a "may adversely affect" situation that the Corps would need to address through section 7 consultation with the Service, if the species were to have been listed. However, the Service does not anticipate that turbidity produced from gravel-mining of unconsolidated substrates would likely jeopardize the continued existence of the Alabama sturgeon.

Issue 9: Several respondents were concerned that if the Alabama sturgeon were listed anyone could file a class action suit and stop a Federal project (such as maintenance dredging) or stop the issuance of discharge permits.

Response: Citizen suits, not class action suits, are available under the Act. However, it is unlikely that suits challenging activities already determined by the Service not to be likely to jeopardize the continued existence of a species would be successful.

Issue 10: A few respondents felt that the Service should not change its position on various issues addressed within the proposed rule after the rule had been published.

Response: The Service has modified its position on a number of issues addressed in the proposed rule; these changes are reflected in this final decision document (see the response to Issue 39). As new information becomes available, the Service, as part of its review process, is expected to and should modify and clarify its position from what was stated in the proposed rule. This is a normal procedure. A species is considered for Federal protection through the proposed rule process as a means of soliciting comments. The period in which comments are solicited in a proposed rule is typically 60 to 90 days but may be much longer, as was the case with the proposed rule for the Alabama sturgeon. The Service is then expected and required to modify and clarify its position based on any pertinent comments that the Act allows the Service to consider.

Issue 11: Some respondents wanted to know if the Alabama sturgeon has any economic value.

Response: The Alabama sturgeon, according to historic records, once sustained a significant commercial fishery (see the response to Issue 18 and the "Background" section of this notice); if the species is recovered, it may again be a valuable economic resource. However, section 4(b)(1)(A) of the Act requires that a decision to list a species shall be based solely on the best scientific and commercial data available on the species' status. Therefore, the Service cannot weigh a species' economic value when it is being considered for protection under the Act.

Issue 12: Several respondents wanted to know who would make the final listing decision.

Response: The decision on whether to add a species to the Federal list of endangered and threatened wildlife and plants (50 CFR part 17) is made by the

Director of the Service under authority delegated by the Secretary of the Interior.

Issue 13: Several respondents supported the proposed rule and urged the Service to protect the Alabama sturgeon.

Response: The Service finds that such action is not presently supportable but will continue to survey for the sturgeon and can repropose its listing at any future time should sufficient information that the species still exists become available.

Issue 14: One respondent stated that the decline of the sturgeon was an early warning sign of a decline in the Alabama River's ecosystem.

Response: The Service agrees that the sturgeon's decline over the past 100 years or more is likely another warning that the ecosystem may be in trouble (see the "Background" section of this notice).

Issue 15: Several respondents felt that there was no firm evidence that the Alabama sturgeon still existed and therefore should not be listed.

Response: An Alabama sturgeon was captured in December 1993 and comments were received from scientists pertaining to the species' continued existence (see chronological history of the proposal in the above "Previous Federal Actions" section for a further discussion of this issue). Based on all available information, the Service does not assume that the Alabama sturgeon still exists, even in low numbers. It is possible that future surveys will reveal an existing population of this fish. There are numerous other examples of the rediscovery of fishes long thought to be extirpated or extinct in the scientific literature (Kuhajda, *in litt.*, 1994).

Issue 16: Several respondents felt it was disrespectful that Service personnel were not present in the hearing room during the entire January 31, 1994, hearing, and some respondents felt that Service personnel should have been present at all times so they could hear every comment that was made.

Response: Senior-ranking Service personnel (a Deputy Director from the Service's Washington Office and two Assistant Regional Directors from the Service's Southeast Regional Office) were present in the audience during the hearing in question. This represents a greater Service presence than is normal or required by the public hearing process. Furthermore, transcripts of all oral statements made during the public hearing have been reviewed by the Service in making this final decision.

Issue 17: Some respondents questioned the Service's use of life history and habitat preference

information from related species to make assumptions regarding the behavior of the Alabama sturgeon. Other respondents provided copies of some sturgeon publications that the Service did not reference in the "References Cited" section of the proposed rule and felt the Service should use all relevant papers on sturgeon species from the Mississippi River system.

Response: It is a common practice in science to use information on closely related species to help form judgments on the needs of rare species where little information exists (Mayden and Kuhajda, in press). For example, when the Service was researching reintroduction techniques for the rare California condor and whooping crane, the Service used the related Andean condor and sandhill crane as substitutes, respectively. Certainly, specific studies of a species would be the ideal. However, when a species is rare and little data exist, information on related species provides valuable insights. Most of the inferences regarding the Alabama sturgeon's life history and environmental requirements were derived from studies of the closely related shovelnose sturgeon.

The Service appreciates receiving additional information on the biology of sturgeons from the Mississippi River system. The Service has incorporated some information from these publications, where appropriate. However, the Act does not require the Service to cite every publication on related species in order to make a determination that a species qualifies for the Act's protection.

Issue 18: One respondent stated that the Service should not use an "arcane" report that is a century-old in its assessment of the historic abundance of the Alabama sturgeon.

Response: The Service did use a nearly century-old report to Congress concerning commercial fish harvests from interior waters of the United States (U.S. Commission of Fish and Fisheries 1898) in concluding that the Alabama sturgeon was historically more common in the Mobile River system. This 1898 report, which estimated a commercial Alabama sturgeon harvest of 18,000 kg (39,500 lb) from the Alabama River, provides valuable historic insight into the Alabama sturgeon's abundance at the turn of the century. As discussed in the responses to Issues 2, 11, and 27, the Service is required by the Act to make a listing determination utilizing the best available scientific and commercial information. Thus, the Service concludes that it was appropriate to use these available commercial fisheries

data as to the former historical abundance of this sturgeon.

Issue 19: Several respondents were concerned that Service biologists contacted individuals and reporters to discuss the listing and tried to sway public opinion concerning issues that developed subsequent to publication of the proposed rule. This concern was expressed particularly with reference to the Service's explanation regarding the extent of any impact the listing might have on maintenance dredging and navigation in the Mobile River system and the Tennessee-Tombigbee Waterway (TTW).

Response: The proposed rule stage of the listing process provides an opportunity to gather information on a species and to discuss the merits and effects of protecting that species under the Act. During the proposed rule stage, misconceptions often develop regarding the potential impacts of the listing on existing programs and activities. When a misconception exists or when the Service recognizes that the media, local officials, or others have made erroneous statements, the Service is obligated to inform the public that a misconception or misinformation exists.

For example, the Service stated in the proposed rule that maintenance dredging was a threat to the Alabama sturgeon. This statement was interpreted by many to mean that if the fish were listed, maintenance dredging would be stopped, navigation would cease, and as a result the region would be left in economic ruin. The Service agrees that if navigation in the Mobile River system were stopped, the economic impact would be tremendous. However, the Service does not believe nor did it intend to imply that maintenance dredging for navigation and the Alabama sturgeon cannot coexist; they can coexist, and the Service pledges to continue working with the Corps toward this end (see the response to Issues 1, 46, and 47 for a detailed discussion of why listing would not have significantly affected maintenance dredging or navigation).

Section 7 of the Act and implementing regulations (50 CFR part 424) make a clear distinction between activities that may adversely affect a species and activities that are likely to jeopardize a species' continued existence. Federal agencies are required to avoid the likelihood of jeopardizing a listed species' continued existence, but the Act does not require Federal agencies to avoid all negative impacts to a listed species. Thus, at public hearings, in interviews with reporters, and during conversations with individuals and agencies, Service

biologists attempted to clarify this issue regarding any listed species. These attempts at clarification were not improper.

Issue 20: A few respondents stated that the Act should balance the needs of listed species with the needs of people.

Response: Since the Act's inception in 1973, the Service has consulted on tens of thousands of projects and has developed a long record of balancing the needs of species with the needs of society. Section 7 of the Act requires the Service to assist Federal agencies in determining whether their actions will likely jeopardize the continued existence of listed species. However, the Act also calls for the Service to recommend alternative courses of action that are protective of the species but still allow for project objectives to be met. Only a few situations have arisen in the past 2 decades where disagreements between the Act and development interests could not be resolved. In all other cases, the Service, through the cooperative efforts of governmental agencies, industry, and individuals, was able to reach equitable solutions.

If after consulting in good faith the Service and the Federal agency cannot resolve a jeopardy situation, the Act provides a further means to balance human needs with the needs of species. Section 7(h)(1)(A)(ii) provides for exemptions to the requirements of the Act when, among other things, the benefits of a Federal action clearly outweigh the benefits of an alternative course of action that would conserve the species.

The Service's section 7 consultation history in the State of Alabama provides a good example of how the Service has been able to balance the needs of species and people in section 7 consultations. The citizens of Alabama have been coexisting with many endangered species for a number of years. As of November 30, 1994, the State of Alabama had the fourth largest number of federally listed species (88) of any State in the nation. From 1988 to 1993 the Service's Daphne, Alabama, Field Office, reviewed about 10,000 Federal actions in Alabama for compliance with the Act. During that time period, they issued only one jeopardy biological opinion that resulted in stopping a project. In that particular case, there were no reasonable and prudent alternatives to the proposed action; the project proponent elected to withdraw the project, rather than initiate the Act's exemption process (50 CFR parts 450-453).

Issue 21: Scientists who closely examined the data that were used to

describe the Alabama sturgeon generally agreed that Williams and Clemmer (1991) made statistical and procedural errors in their analysis. Some biologists, upon examination of those data and additional data to that provided by Williams and Clemmer (1991), concluded that the Alabama sturgeon was still a valid species. Other biologists, based on their analyses, maintained that the Alabama sturgeon and the shovelnose sturgeon (*S. platyrhynchus*) were the same species.

Response: Ichthyologists provided considerable information concerning the taxonomic status of the Alabama sturgeon during the comment period (see the "Background" section of this notice for a discussion of this material). However, all of the taxonomic information has consisted of unpublished reports; none of this taxonomic information has been subjected to peer-review and accepted for publication in a scientific journal, with the exception of the study by Mayden and Kuhajda (in press). The description of the Alabama sturgeon as a full species by Williams and Clemmer (1991) is the only taxonomic account that has been published in a peer-reviewed scientific journal. However, the study by Mayden and Kuhajda (in press) corroborates the determination of Williams and Clemmer (1991) that the Alabama sturgeon is a distinct species. Thus, until such time that the Alabama sturgeon's current taxonomic status is revised in an appropriate peer-reviewed scientific journal, the Service will consider the Alabama sturgeon (*S. suttikusi*) to be a full species that is distinct from the shovelnose sturgeon (*S. platyrhynchus*) (see the response to Issue 22 for a discussion of why the Alabama sturgeon would still qualify for protection under the Act even if it were determined to be a subspecies or population of the shovelnose sturgeon).

As indicated in the Background section, the Service has received a very recent study report prepared for the Corps of Engineers and the Service (Genetic Analyses 1994). The study compared a number of nuclear DNA markers for the three *Scaphirhynchus* sturgeon and found no measurable difference between pallid and shovelnose sturgeons but significant differences between those sturgeons and the one Alabama sturgeon. Further, this study does show that the single specimen of Alabama sturgeon captured in 1993 was considerably different from pallid and shovelnose sturgeons. This genetic study also indicated that another specimen of Alabama sturgeon would very likely provide conclusive evidence of these consistent differences.

Issue 22: Several respondents recognized that if the Alabama sturgeon's taxonomic status could not be resolved, the Act would allow the Service to list the Alabama sturgeon as an endangered subspecies or distinct population of the shovelnose sturgeon (*S. platyrhynchus*). However, opinions differed greatly concerning the appropriateness of such a listing. A few respondents stated that the Service should defer any decision to list the Alabama sturgeon until a full taxonomic review of the species is completed.

Response: Taxonomic questions regarding the Alabama sturgeon's status as a full species have been raised, and the Service admits that there is controversy surrounding this issue. However, as discussed in the response to Issue 21, the only peer-reviewed scientific publication on the Alabama sturgeon's taxonomic status is Williams and Clemmer (1991). Further, a study by Mayden and Kuhajda (in press), which has been accepted for publication in a peer-reviewed scientific journal, corroborates the determination of Williams and Clemmer (1991) that the Alabama sturgeon is a distinct taxonomic species. Upon publication of the study by Mayden and Kuhajda (in press), two peer-reviewed scientific publications will support the distinct taxonomic status of the Alabama sturgeon.

The Alabama sturgeon (*S. suttikusi*) has been recognized in both the proposed rule, the June 21, 1994, notice of extension, and this notice of withdrawal as a distinct species, not a population or subspecies (see the response to Issue 21 and the "Background" section of this notice). However, the Act (section 3(15)) provides for listing subspecies or distinct population segments of vertebrate species as endangered or threatened. Thus, if the Alabama sturgeon is subsequently recognized as a distinct subspecies or population segment of the shovelnose sturgeon (*S. platyrhynchus*), it would still qualify as being eligible for the Act's protection. This second conclusion is based on the fact that, even if the sturgeon in the Mobile River system is the shovelnose sturgeon and not recognized as a subspecies of that species, it is a distinct population segment of a vertebrate species and is a population that may be in danger of extinction (see the "Summary of Factors Affecting the Species" section of this notice).

To explain further, all members of the genus *Scaphirhynchus* are freshwater fish (Bailey and Cross 1954), and there are no known records of any member of this genus in marine waters or the

intermediate rivers between the mouths of the Mississippi and Mobile Rivers. Thus, if the Alabama sturgeon's taxonomy is subsequently revised to population status in a peer-reviewed scientific journal and the revision is generally accepted by the scientific community, the Service would recognize that information to reflect the most current nomenclature.

Issue 23: A few respondents presented a list of potential impacts, including impacts to recreation, flood control, existing interstate water disputes, and numerous other water-related issues. However, little specific information was presented to indicate how the listing would impact these activities.

Response: Without specific information on how these activities would have been impacted if this species had been listed, the Service is unable to evaluate the extent of the impacts and in any case is not allowed to consider such impacts when determining any species to be endangered or threatened. However, the Service does not foresee significant impacts to these activities if the Alabama sturgeon were to be listed in the future.

Issue 24: One respondent commented that the Service should not list another species because the Service has a poor record of recovering species and the Service cannot take care of all the species already on the list.

Response: As outlined in the response to Issue 2, the Act allows the Service to consider only information related to the species' status when deliberating as to whether a determination of endangered or threatened status is warranted under the Act. Therefore, the Service cannot and does not consider its historic recovery record or its current recovery workload in determining whether a species deserves protection of the Act.

Issue 25: Several respondents commented that, as the Service had not prepared a Regulatory Impact Analysis or complied with the Regulatory Flexibility Act, it could not proceed with the listing.

Response: In dealing with this rulemaking process, the Service has complied with all applicable laws, regulations, and departmental guidance. Preparation of a Regulatory Impact Analysis was an element of Executive Order 12291, which was revoked by Executive Order 12866. The Service is exempt from the requirements to comply with the Regulatory Flexibility Act with respect to the listing process under section 4 of the Act in accordance with the intent of Congress.

Issue 26: There were allegations from some respondents that the minimum

flow requirement of 90 cubic meters per second (cms) (3,000 cubic feet per second (cfs)) for the Alabama sturgeon, which was stated in the proposed rule, was arrived at arbitrarily. There was also concern that if any minimum flow releases were necessary, substantial loss of revenue from hydropower facilities at Robert F. Henry and Millers Ferry Locks and Dams would occur and that hydroelectric dams further upstream in the Alabama River system could also be affected by the listing.

Response: A series of dams now control water flows in much of the Mobile River system. Changes in the natural flow patterns have probably had both direct and indirect effects on the Alabama sturgeon and its habitat. In the proposed rule, it was stated that "The Service expects that continuous minimum flows of approximately 3,000 [cfs] will be required [to sustain the Alabama sturgeon] below both Robert F. Henry and Millers Ferry Locks and Dams on the lower Alabama River" and that "... minimum flows below Claiborne Lock and Dam are already maintained at approximately 5,000 cfs to provide for cooling water intake of downstream industry." Although the Service concedes that little information on the flow needs of the sturgeon is available, a minimum figure of approximately 90 cms (3,000 cfs) was arrived at by Service and other biologists familiar with the Alabama River and its fish populations.

The Service now has information that the Alabama Power Company (APC), through an agreement with the Corps, attempts to maintain (for the purposes of navigation) a minimum average daily flow of approximately 149 cms (4,640 cfs) over any seven consecutive day period and a minimum average daily flow of approximately 81 cms (2,667 cfs) over any three consecutive day period downstream of Claiborne Lock and Dam. Further, the average daily flows over the last decade downstream of Claiborne Lock and Dam have ranged from 114 to 6912 cms (3,800 to 244,000 cfs). Therefore, the Service believes that the minimum average daily flows, as agreed to by the Corps and the APC, coupled with historic and Federal Energy Regulatory Commission (FERC)-ordered flow patterns, are likely adequate to sustain any Alabama sturgeon in this river reach.

The Service's opinion on flow requirements for river segments upstream of Claiborne Lock and Dam, as stated in the proposed rule, has changed somewhat. The Service's position remains that the best biological judgment at this time is that a combined minimum average daily flow of

approximately 90 cms (3,000 cfs) from the Robert F. Henry and Millers Ferry Locks and Dams would be required to maintain a population of the Alabama sturgeon upstream of Claiborne Lock and Dam. However, the continued existence of the sturgeon upstream of Claiborne Lock and Dam has not been substantiated in nearly a decade, although anecdotal evidence exists.

Therefore, based on our current knowledge of the Alabama sturgeon, no changes in water releases from these structures or from structures located in the headwaters of the Alabama River system (e.g., Coosa and Tallapoosa Rivers) would have been suggested for the benefit of the sturgeon nor would they have been anticipated by the Service as a result of listing. Thus, without changes in flow releases from power-generating dams, there would have been no loss of electrical power revenue resulting from any listing of the Alabama sturgeon.

Issue 27: Numerous respondents maintained that the listing of the Alabama sturgeon would devastate Alabama's economy and requested that the Service consider economic, social, or other impacts that might occur if the Alabama sturgeon was listed. They also requested that the Service, as a result of these forecasted impacts, withdraw the proposal to list the Alabama sturgeon.

Response: Section 4(b)(1)(A) of the Act requires the Service to base its decision on whether to list a species solely on the best scientific and commercial data available on the species' status and precludes the Service from considering economic or other impacts that might result from the listing. Public comments directed to economic or other impacts are outside the scope of topics that the Service can consider in making any final rule determination. However, even though economic impacts cannot be considered in the listing process, the Service believes that the impact from a listing action on the region's economy would have been minimal (see the responses to Issues 1, 6, 26, 30, 46, and 47).

Issue 28: In the proposed rule, the Service maintained that channel-training devices could be used to further reduce the need to conduct extensive maintenance dredging operations in the Mobile River system. Some respondents disagreed, stating that the Corps was using as many channel-training devices as was necessary.

Response: In the proposed rule, the Service cited studies by the Corps and others that the use of channel-training devices (e.g., training dikes, jetties, sills, and revetments) in several rivers in the eastern half of the United States reduced

dredging requirements by over 50 percent. The Corps' own data stated that structures in the Alabama River were assumed to eliminate about 60 percent of dredging requirements at the specific location where such structures were designed and constructed in the last phase of training works on the Alabama River. The present system on the Alabama River consists of 67 channel training works at 16 locations. The Corps has subsequently stated that, based on the Mobile District's criteria for the use of training works, these structures are already used to the maximum extent practicable. However, the Service understands that the Corps will continue to evaluate their use, will modify existing structures as necessary, and may construct additional training devices when justified.

Although the Service believes that training devices could reduce impacts to the Alabama sturgeon and encourages the Corps to consider their use in future planning, the Service does believe that more training devices would not be required to avoid jeopardy to the Alabama sturgeon, if ever listed in the future.

Issue 29: Several respondents expressed concern as to why non-Service biologists were permitted only 15 minutes to examine the dead Alabama sturgeon captured in December 1993 and why the Service decided that live tissue samples could not then be taken from the fish.

Response: The Service concedes that the 15 minutes granted to biologists associated with the Coalition to examine a specimen of a rare, poorly known sturgeon on or about January 7, 1994, may have been an insufficient amount of time in which to make a detailed identification. However, a short time for examination was considered best in order to prevent significant thawing of the frozen specimen and thus prevent further deterioration. Additionally, the 15-minute time interval was mutually agreed upon by biologists with both the Coalition and the Service but was negotiable, as subsequently clarified in a letter from the Service to the Coalition dated January 19, 1994. This letter stated, in part, "... * * * additional time could have been arranged [to examine the sturgeon] had there been a request for such." No official request was made to the Service or hatchery staff for additional time to examine the fish prior to or during the Coalition's visit to the State of Alabama's Marion Fish Hatchery. No Service representative was present for this examination, but a representative from the Corps was in attendance to view the sturgeon. Hatchery personnel were informed of

the agreement between the Coalition and the Service and thus allowed the Coalition representatives only the previously agreed-upon 15 minutes in which to study the specimen.

The Coalition sent a letter to the Service on December 7, 1993, requesting fresh blood and muscle tissue samples from the live sturgeon that had been captured a few days earlier. In a letter dated December 17, 1993, the Service stated that it did not take muscle and blood samples from the sturgeon because of the intrusive nature of the sampling and the potential to traumatize or cause the death of the fish. However, fin clips were made and frozen for future study. When the Coalition received word that the sturgeon had been found dead on December 31, 1993, they arranged an examination of the fish. A January 6, 1994, letter from the Coalition and a January 12, 1994, letter from the Corps formally requested that the Service provide tissue samples from the now-frozen sturgeon and subsamples of the fin clips obtained prior to its death.

However, Service biologists decided that no intrusive tissue samples should be taken from the sturgeon prior to the necropsy that was to be conducted at the National Biological Survey's laboratory in Leetown, West Virginia. It was stated in Service letters dated January 18, 1994, to the Corps and January 19, 1994, to the Coalition that samples of tissue removed from the fish might jeopardize any chance for a determination of its cause of death but that a muscle tissue sample would be provided to Coalition biologists after the necropsy was completed. Immediately after the examination of the fish by biologists representing the Coalition, the carcass was shipped to the West Virginia laboratory. Following the necropsy, muscle tissue samples were sent to Coalition biologists and to the Corps.

Issue 30: Some respondents expressed concern regarding the potential effects the listing of the Alabama sturgeon would have on coalbed methane-associated industries.

Response: The extraction of coalbed methane can necessitate the release of produced water into the environment, and this discharge was mentioned as a potential threat to the Alabama sturgeon in the proposed rule. The Corps authorizes produced-water discharge structures pursuant to section 10 of the RHA (33 U.S.C. 403) if the outfall structure is placed into navigable waters of the United States. The Corps typically authorizes these structures with a Letter of Permission. Letters of Permission are a type of permit issued through an

abbreviated processing procedure that includes coordination with Federal (including the Service) and State fish and wildlife agencies, as required by the Fish and Wildlife Coordination Act (FWCA), and a public interest evaluation, but without publishing an individual public notice. Letters of Permission may be used in those cases subject to section 10 of the RHA when, in the opinion of the District Engineer, the proposed work would be minor, would not have significant individual or cumulative impacts on environmental values, and should encounter no appreciable opposition. Additionally, prior to discharge, the applicant must receive a permit from the State of Alabama under National Pollution and Discharge Elimination System (NPDES) guidelines. As the last known occupied habitat of the Alabama sturgeon existed far downstream of these permit activities, the Service does not believe that any modification to existing discharge structure authorization procedures is needed to protect the Alabama sturgeon.

The potential coalbed methane wells are far upstream of known Alabama sturgeon habitat and any discharge must meet State water quality standards (the Service has stated that the water quality standards will not have to be modified in order to protect the Alabama sturgeon). Therefore, the Service does not anticipate any direct or indirect impacts to the Alabama sturgeon from properly permitted produced-water discharges.

Issue 31: One respondent stated that he had seen sturgeon swim through locks and that the recently caught Alabama sturgeon might actually be a shovelnose sturgeon that had passed down the TTW from the Tennessee River system.

Response: Based upon morphological characters that can be used to differentiate the two sturgeon populations (see the "Background" section of this notice), various ichthyologists verified that the sturgeon caught in the Alabama River in December 1993 was an Alabama sturgeon. In addition, it is true that the opening of the TTW potentially facilitates the movement of certain fishes between the Tennessee and Tombigbee Rivers. However, passage of a shovelnose sturgeon from the Tennessee River system through the TTW, down the entire length of the Tombigbee River, and up the lowermost portion of the Alabama River to where the specimen was captured would require swimming downstream through a total of 12 locks. The shovelnose sturgeon is thought to migrate limited

distances (see the "Background" section of this notice), but the likelihood of an individual sturgeon traversing a distance of over 645 kilometers (km) (400 miles (mi)) and getting caught in a gill net in the Alabama River is remote. Furthermore, populations of the shovelnose sturgeon in the lower Tennessee River are thought to be low, based on reports from commercial fishermen (John Conder, Tennessee Wildlife Resources Agency, personal communication, 1994).

Issue 32: One respondent quoted from a newspaper article that stated the Act's scatter-shot attempt to preserve everything made little sense and that unless the law was changed, biologists eventually would identify enough rare species for Federal protection to make everywhere off limits to humans. Another respondent noted that nature itself has destroyed the vast majority of life forms and that extinction is an inevitable fact of evolution.

Response: The Act specifically states that the Service is to list those species that are in danger of extinction throughout a significant portion of their range and that only the best biological information available can be used in these determinations (see the responses to Issues 2 and 27). At the present time, over 900 native species have been listed and tens of thousands of consultations (informal or formal) have been made with only a small percentage creating significant problems for the project or local economy. While it is true that catastrophic events over geological time have resulted in the extinction of millions of species since life evolved on our planet, the rate of extinctions in the past couple of centuries has accelerated dramatically as a direct result of human activities.

Issue 33: One respondent noted that the listing of the Alabama sturgeon would impact individuals conducting private activities by forcing them to pay for implementing costly habitat conservation plans (HCPs).

Response: The Service assumes that these activities are land-use activities that have no Federal permit requirement or funding source. Section 9 of the Act lists prohibited activities with respect to endangered species, including "take" (e.g., kill, wound, harm). Section 10(a) of the Act provides that private individuals whose activities would incidentally take a species may obtain an "incidental take permit" provided they prepare and are able to implement a habitat conservation plan (HCP) that meets the requirements of section 10(a)(2)(B). However, there is no need to prepare and implement an HCP unless it is established that an individual's

activity would incidentally result in the take of a listed species.

Issue 34: Some respondents noted that some sturgeon species actually might benefit from deep-water habitats created by various dredging activities.

Response: Other sturgeons have been documented from deep dredge holes of rivers. However, dredging should not be construed as an activity that is totally compatible with the well-being of the sturgeons (see the responses to Issues 1 and 8). Certain dredging activities may compromise foraging and spawning habitat for a sturgeon by removing relatively stable substrate and destabilizing adjacent habitat. Dredging, therefore, should not necessarily be viewed as a means of creating deep-water habitats with stable substrates for any sturgeon.

Issue 35: Several respondents stated that commercial fishing should be implicated in the overall decline of the Alabama sturgeon. Another respondent speculated that overexploitation of the paddlefish (*Polyodon spathula*) for its eggs in the 1980s may have resulted in an increased incidental catch of the Alabama sturgeon. This may have contributed to the sturgeon's decline.

Response: There is an historic account of commercial harvest for sturgeons in the Mobile River system at the turn of the century (U.S. Commission of Fish and Fisheries 1898) that stated that 18,000 kg (39,500 lb) of Alabama sturgeon were harvested. However, without historic population information, the Service cannot conclude that the Alabama sturgeon was overharvested during that period. Furthermore, the Service has no evidence, other than anecdotal reports, that incidental catches of the Alabama sturgeon occurred during the paddlefish fishery in the 1980s and contributed to the sturgeon's decline (see Factor B in the "Summary of Factors Affecting the Species" section of this notice). The Service believes that massive alteration of the river's aquatic ecosystem has played the most significant role in the Alabama sturgeon's decline (see Factor A in the "Summary of Factors Affecting the Species" section of this notice and the response to Issue 36). However, the Act does not require that the specific causative agents be known or even be well understood for a species to qualify for Federal protection.

Issue 36: Several respondents stated that the Service overemphasized the impact that recent impoundments may have had on the decline of the Alabama sturgeon.

Response: The Service acknowledges that the specific causes of the Alabama sturgeon's current status are poorly

understood. However, the Service believes that it is reasonable to conclude that the impoundments constructed on the Alabama River in the late 1960s and early 1970s likely played a significant role in the decline of the Alabama sturgeon (see Factor A in the "Summary of Factors Affecting the Species" section of this notice). Additionally, even if reservoirs were not a factor, the Act does not require that the Service know all the specific causes of a species' decline before the Service can decide to list the species. The Act requires only that the Service use the best available information on the species' status to support the conclusion to list any species that is in danger of extinction (see the response to Issue 2). With respect to the Alabama sturgeon, as discussed under Factor A in the "Summary of Factors Affecting the Species" section of this notice, the best available information demonstrates that it has suffered a dramatic decline in both population size and range over the past 100 years, even if there are some uncertainties as to the cause(s) of this decline.

Issue 37: Several respondents stated that the Service should not use anecdotal information in this rulemaking process.

Response: The Service has included some anecdotal information in this notice. However, the decision whether to list this species was not based on anecdotal information (see the "Summary of Factors Affecting the Species" section of this notice).

Issue 38: One respondent contradicted statements made by the Service in the proposed rule that the shovelnose sturgeon had changed its diet, allegedly because of the effects of channelization activities.

Response: The Service concedes that the reference in the proposed rule to a shift in the shovelnose sturgeon's diet, attributed to channelization activities, was erroneous. Any assertion that changes in the shovelnose sturgeon's food habits resulted from channelization activities has been deleted from this notice and was not considered when making the decision to withdraw the proposal.

Issue 39: Several respondents expressed concern over differences between how the Service addressed certain issues in the June 15, 1993, proposed rule and how the Service addressed these issues in subsequent oral presentations and official documents, especially the June 21, 1994, notice of a 6-month extension of the deadline and reopening of the comment period.

Response: The Service has received numerous comments and has had discussions with other Federal agencies (including the Corps) regarding the Alabama sturgeon's biology and taxonomic status and how listing the species could impact and be impacted by Federal activities. When clarifying information was provided by all these contacts, the Service considered it and has altered, as it should, its position on some factors addressed in the proposed rule (see the response to Issue 10 for a further discussion of this issue). These modifications of Service positions were partially reflected in the June 21, 1994, notice of a 6-month extension of the deadline. However, a full discussion of the Service's position on these issues, as influenced and modified by public comments, is contained in this notice.

Issue 40: A few respondents stated that the June 21, 1994, notice of a 6-month extension of the deadline did not make it clear to them what type of comments the Service was seeking.

Response: The Service stated in the June 21, 1994, notice of a 6-month extension of the deadline that the Service was primarily seeking additional information on the population status of the Alabama sturgeon. However, in the development of this notice, the Service has considered all the comments received through October 17, 1994, the end of last open comment period.

Issue 41: In the June 15, 1993, proposed rule, the Service referred to the sturgeon that was being proposed for endangered species status as the "Alabama sturgeon." However, in the June 21, 1994, notice of a 6-month extension of the deadline, the Service referred to this same sturgeon as the "Mobile River system population of the Alabama sturgeon." Several respondents stated that this change created confusion as to whether the Service was proposing a species or a population of a species for Federal protection.

Response: The reference to the Alabama sturgeon as the "Mobile River system population of the Alabama sturgeon" in the June 21, 1994, notice was an error, and the Service regrets any confusion that may have been generated by this statement. The Alabama sturgeon was proposed as a distinct taxonomic species for endangered species status in the June 15, 1993, proposed rule, and the Alabama sturgeon was recognized as a full species in the June 21, 1994, notice (see 59 FR 31972, col. 3, lines 4-11), as well as in this notice (see the "Background" section of this notice and the response to Issues 21 and 22).

Issue 42: Several representatives of industries located along the Alabama River commented that they had, through their NPDES permit activities, collected large numbers of fish from the Alabama River, but they had never seen a sturgeon.

Response: Considering the rarity of the Alabama sturgeon and the difficulty of collecting the species as shown by the effort expended by the Service and the State of Alabama over the past several years that resulted in the capture of only one Alabama sturgeon, the Service is not surprised that fish collections associated with NPDES activities failed to encounter this species (see the "Background" section of this notice).

Issue 43: Several respondents stated that the Service should extend the comment period beyond the October 17, 1994, deadline to allow for public comments regarding the Service's Alabama sturgeon collection efforts.

Response: The comment period on the Alabama sturgeon proposed rule was reopened from September 15, 1994, through October 17, 1994 (September 15, 1994; 59 FR 47294) to allow for additional scientific peer review regarding the Alabama sturgeon's continued existence. The closing date of the comment period was set at October 17, 1994, to provide sufficient time for the Service to review all available information and comments and then draft this notice in order to publish the document by the December 15, 1994, deadline. The time allowed for the development and review of the document is far less than is normally provided, and the Service believed that the comment period could not have been extended beyond October 17, 1994, without compromising the Service's ability to meet the December 15, 1994, publication deadline.

Issue 44: A few respondents raised the issue of the viability of the remaining Alabama sturgeon population, and one individual commented that the Service should not list the Alabama sturgeon because there are not enough of them left in the river to maintain a viable population.

Response: The Alabama sturgeon population was significantly reduced in numbers, and there is not enough information presently available to conclude that the species still exists.

Issue 45: One respondent stated that the Service had used Williams and Clemmer (1991) as the taxonomic authority for the Alabama sturgeon in the proposed rule but used Mayden and Kuhajda (in press) as the taxonomic authority in the notice of a 6-month extension of the deadline.

Response: The Service did not intend to imply that the study by Mayden and Kuhajda (in press), which had not been accepted for publication at that time, was the taxonomic authority for the Alabama sturgeon when the notice of a 6-month extension was published. As referenced in Issue 21 and 22, as well as in the "Background" section of this notice, Williams and Clemmer (1991) have the only peer-reviewed scientific publication regarding the taxonomic status of the Alabama sturgeon. Therefore, the Service continues to consider Williams and Clemmer (1991) to be the taxonomic authority for the Alabama sturgeon. However, Mayden and Kuhajda (in press) has recently been accepted for publication in a peer-reviewed scientific journal. Upon publication of the study by Mayden and Kuhajda (in press), two peer-reviewed scientific publications will support the Service's contention that the Alabama sturgeon is a distinct taxonomic species.

Issue 46: Concern was expressed that listing the Alabama sturgeon would significantly impact commercial barge traffic if the Corps could not remove rock shelves from the navigation channel.

Response: The Alabama and Tombigbee Rivers naturally move laterally, and to some extent, vertically. This natural river channel movement exposes rock shelves at the outer bends of the river. In order to provide for a reliable and safe navigation channel, these rock shelves must sometimes be removed, and similar channel alignment improvements of covered consolidated material are sometimes necessary on the inside bends. Although the removal of these obstructions to navigation are usually infrequent and restricted to isolated areas, this activity may adversely affect the Alabama sturgeon.

The Corps and the Service have informally discussed the potential impacts to the Alabama sturgeon of removing these rock shelves, and both agencies agree that, if the Alabama sturgeon were ever listed, section 7 consultation would be required prior to the commencement of any rock shelf removal project within or adjacent to potential Alabama sturgeon habitat. However, since both agencies agree that rock shelf removal projects are generally not emergency projects, there will be a significant period of time prior to the next dredging season for both agencies to consider the timing and habitat improvements that may be possible by the design and construction of the remaining shelf after excavation and by the selective placement of the excavated material. Thus, the Service does not anticipate that any consultations would

result in a jeopardy situation or result in delays in these maintenance dredging activities should the species ever be listed.

Issue 47: Several respondents expressed concern that listing the Alabama sturgeon could significantly impact maintenance dredging for non-Federal activities.

Response: The Corps authorizes maintenance dredging for non-Federal navigation projects. Although these projects are usually on a much smaller scale than the Corps' annual maintenance dredging activities, they involve the removal of unconsolidated aggregate from navigable waters of the United States and include the discharge of some material back into the waterways. Thus, maintenance dredging by non-Federal entities comes under the Corps' authority pursuant to section 10 of the RHA (33 U.S.C. 403) and section 404 of the CWA (33 U.S.C. 1344).

Maintenance dredging by non-Federal entities for navigation removes unconsolidated aggregate (e.g., sand, mud, and silt) that washes down from upstream portions of the river and from tributaries. Based on limited information on the Alabama sturgeon and studies of the shovelnose sturgeon, it appears that these fish require currents over relatively stable substrates for feeding and spawning (see "Background" section of this notice). They are generally not associated with the unconsolidated substrates that settle in slower current areas. Therefore, removal and disposal of unconsolidated materials is not perceived as a direct threat to the sturgeon or to its feeding or spawning habitat.

Prior to the Corps' issuance of a section 404 permit for non-Federal maintenance dredging, the applicant must receive State water quality certification from the State of Alabama pursuant to section 401 of the CWA. As the Service does not believe that more restrictive water quality standards will be needed to protect the Alabama sturgeon from this activity, the likelihood of an applicant receiving a State water quality certification will not be affected by the listing of the Alabama sturgeon. Additionally, as addressed above under Issue 1, temporary increases in turbidity associated with maintenance dredging activities are not currently believed to adversely effect the Alabama sturgeon; and, as dredge material from non-Federal maintenance dredging projects is traditionally disposed of at upland sites, potential impacts to the sturgeon are further reduced.

Issue 48: Comments from the Corps and others concerned the effect of

listing the Alabama Sturgeon would have upon other Corps regulatory activities, such as authorizing pipeline crossings, piers, wharves, and small boat channels. These non-Federal activities are regulated through the Corps' regulatory program and evaluated on a case by case basis. Thus, concern has been expressed that if the Alabama sturgeon were ever listed permit applicants would be burdened by time delays and by requirements to conduct sturgeon surveys.

Response: Although these activities are on a much smaller scale than most other activities authorized by the Corps, these actions are more numerous and, therefore, could present a greater number of opportunities for the Service to consider impacts to the sturgeon. The Service recognizes that some of the non-Federal activities authorized by the Corps (e.g., bridge pier placement and pipeline crossings) in the Alabama River system may have been delayed by a requirement to conduct endangered species surveys (Alabama sturgeon, if listed, plus other listed species). However, it has been the experience of the Service that most of these non-Federal activities do not require a survey and, further, are not delayed because of endangered species issues.

Summary of Factors Affecting the Species

After a thorough review and consideration of all available information, the Service has determined that there is insufficient evidence available to justify listing the Alabama sturgeon. Procedures found at section 4(a)(1) of the Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to the Alabama sturgeon (*Scaphirhynchus suttkusi*) are as follows:

A The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The Alabama sturgeon has experienced a highly significant decline in the last 100 years. An 1898 report to Congress on commercial fish harvests from the interior waters of the United States (U.S. Commission of Fish and Fisheries 1898) estimated a commercial Alabama sturgeon harvest of 18,000 kg (39,500 lb) from the Alabama River near the turn of the century. In the 1930s an *Alabama Game and Fish News* article (Anonymous 1930) stated that the fish

was "not uncommon." However, by the 1980s and into the early 1990s the Alabama sturgeon had become a rare component of the Mobile River ecosystem. Burke and Ramsey (1985) conducted a wide-ranging survey for the fish in the mid-1980s and found only five individuals; the ADCNR searched the river for the Alabama sturgeon in 1990, 1991, and 1992, utilizing a variety of sampling gear, and was unable to capture any specimens (Tucker and Johnson 1991, 1992); and the ADCNR and the Service captured only one Alabama sturgeon after extensive searches in 1993. There is little question that a population that could yield 18,000 kg (39,500 lb) of fish at about 1 kilogram (2 lb) each in the late 1890s, only five fish in the early 1980s, and only one fish in the early 1990s has experienced a highly significant decline.

The distribution or range of the Alabama sturgeon has also been significantly reduced. Based on a review of historic records by Burke and Ramsey (1985), the Alabama sturgeon's range once included 1,635 km (1,022 mi) of the Mobile River system (Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensas, and Cahaba Rivers) in Alabama and Mississippi. During the early to mid-1980s, when Burke and Ramsey (1985) conducted their Alabama sturgeon status survey, they estimated that the Alabama sturgeon had been extirpated from over half (57 percent; 938 km [586 mi]) of its range and that only 15 percent (243 km [152 mi]) of its former habitat had the potential to support a good Alabama sturgeon population. They felt that another 19 percent (310 km [194 mi]) of the fish's remaining potential habitat was marginal. They were unable to judge the status of another 9 percent (144 km [90 mi]) of the historic habitat. Since Burke and Ramsey (1985), there has been only one confirmed Alabama sturgeon captured. That individual was captured after searches by the ADCNR in 1990, 1991, and 1992, utilizing a variety of sampling gear (Tucker and Johnson 1991, 1992), and further searches by the ADCNR and the Service in 1993. It is possible that the Alabama sturgeon may now exist in only a short reach of the free-flowing Alabama River below the Claiborne Lock and Dam, where this last specimen was captured.

From a historic perspective, it is likely that not one but many factors have worked in concert to push the Alabama sturgeon to the brink of extinction. Land clearing for silviculture, agriculture, urban and industrial development, and gravel-mining operations have increased silt loads to the river and altered its water

quality. Impoundments constructed for navigation, recreation, power production, and flood control have reduced the amount of riverine habitat, blocked spawning migrations, and changed the river's flow patterns. Uncontrolled discharges of polluted waste once occurred in the river. An early commercial fishery, as reported by the U.S. Commission of Fish and Fisheries (1898), may have played a role in the fish's initial decline. The physical, chemical, and biological characteristics of the Mobile River system have been altered, and the Alabama sturgeon, which evolved long before these changes occurred, has suffered.

The large-river portions of the Mobile River system are controlled by a series of dams that have changed this once free-flowing river system into a series of artificial impoundments. When rivers are dammed, the physical and chemical environment of the impounded waters changes, and these environmental alterations cause changes in the river's biological communities. Some species respond favorably to this altered environment and increase in numbers and range. Other species that rely on free-flowing large-river habitat for their survival are reduced in numbers or are eliminated.

As the Alabama sturgeon evolved and adapted to survive in a large, free-flowing river ecosystem, the construction of reservoirs likely played a significant role in its decline. The specific mechanisms by which reservoirs in the Mobile River system may have affected the Alabama sturgeon are not fully understood, and there is little specific life history information on the Alabama sturgeon from which to draw conclusions. However, studies of closely related sturgeons provide some insight into how the Mobile River system's reservoirs may have impacted this fish.

The Alabama sturgeon, like the shovelnose sturgeon, probably migrates upstream to spawn (Becker 1983). The dams in the Mobile River system likely either block their migration or at least impede it. The shovelnose sturgeon apparently forages and spawns on relatively stable substrates (Trautman 1981, Hurley and Nickum 1984, Curtis 1990). As the impounded river reaches above the dams accumulate silt, any stable substrate used for spawning could, over a period of time, become unavailable to the fish. Asian scientists in studies of sturgeons (genera *Acipenser* and *Huso*) (Khoroshko 1972, Zakharyan 1972, Veshchev 1982, Veshchev and Novikova 1983) have reported that reservoirs alter flows and

temperature regimes and that these factors adversely affect Asian sturgeons by decreasing their growth rates, decreasing spawning activity, altering gonad development, increasing egg predation, reducing egg survival, and increasing juvenile mortality. Although the Asian studies cited above refer to anadromous sturgeons, some of these same factors may be affecting the Alabama sturgeon.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

As discussed under Factor A and in the "Background" section of this notice, the Alabama sturgeon was commercially harvested around the turn of the century. Also, there are anecdotal reports of incidental catches of the Alabama sturgeon as part of a paddlefish fishery in the 1980s (see the response to Issue 35 in the "Summary of Comments and Recommendations" section of this notice). However, without any other population information, the Service cannot quantify what impact overfishing may have had on the Alabama sturgeon. The Service believes that a massive alteration of the river's aquatic ecosystem has played the most significant role in the Alabama sturgeon's decline and that commercial harvest is not currently a threat to the species. Alabama State law requires the immediate release of any incidentally caught sturgeons. As a result, this sturgeon is currently neither commercially nor recreationally valuable and is not pursued by humans. Based on limited numbers, if any, and the difficulty of capture, overutilization of Alabama sturgeon is unlikely.

C. Disease or Predation

There are no known threats from disease or natural predators. To the extent that disease or predation occurs, it becomes a more important consideration as the total population decreases in number.

D. The Inadequacy of Existing Regulatory Mechanisms

Existing Alabama State law precludes the possession of, and requires the release of, all sturgeons caught with any gear, whether dead or alive (Burke and Ramsey 1985; Fred Harders, ADCNR, personal communication, 1991). Although the needs of the Alabama sturgeon, if ever it becomes protected under the Act, could be considered when Federal activities are authorized or permitted, there is currently no requirement within the scope of other environmental laws to specifically consider the Alabama sturgeon or

ensure that a project will not jeopardize its continued existence.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

In addition to impacts discussed under Factor A, the Alabama sturgeon's reproductive capability has likely been adversely impacted by low numbers of mature individuals. As the Alabama sturgeon's range and population were severely reduced, populations became more scattered and isolated. This isolation has probably reduced levels of successful reproduction and also reduced gene flow among populations. As genetic diversity is reduced, the sturgeon's ability to adapt to adversity has likely been reduced. Reduction in reproductive success will exacerbate the problems impacting this fish and, if not reversed, may ultimately lead to its extinction.

The creation of the TTW has created the potential for the previously allopatric (geographically isolated) shovelnose sturgeon to pass between the Tennessee River (Mississippi River system) and the Mobile River system (see the response to Issue 31 in the "Summary of Comments and Recommendations" section of this notice) and interbreed with the Alabama sturgeon. However, given the small size of the populations of both fishes in these artificially connected river systems and the adversity that dispersing through numerous locks and dams and swimming hundreds of kilometers creates, the probability of genetic mixing between the shovelnose sturgeon and the Alabama sturgeon is presently very low.

The Service has carefully assessed the status of the Alabama sturgeon, as well as, the best scientific and commercial information available regarding the past, present, and future threats faced by the species in making this decision. Based on this evaluation, the Service has decided that insufficient information is available to justify listing the Alabama sturgeon (*S. suttikusi*) at this time. This decision is based primarily on the lack of evidence that the sturgeon still exists.

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Proposed Rule Withdrawal

The Service withdraws the proposed rule of June 3, 1993, (58 FR 33148) to list the Alabama sturgeon as an endangered species and designate its critical habitat. If sufficient new information becomes available to demonstrate the present existence of the Alabama sturgeon, the Service may take action to determine the species to be endangered in accordance with 50 CFR part 424. For the present, the Service places this species in Category 2 of its list of candidate species; category 2 is for those species for which sufficient information is not available to determine whether to proceed with a proposed rule to list or to consider the species no longer an active candidate (e.g., extinct).

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

Dated: December 12, 1994

Mollie H. Beattie,

Director, Fish and Wildlife Service

[FR Doc. 94-30859 Filed 12-14-94, 8:45 am]

BILLING CODE 4310-55-P